

What is claimed is:

1. An amplitude limiting circuit for limiting an
2 amplitude of a signal input to a power amplifier,
3 comprising:
4 an amplitude converter which calculates an
5 amplitude value of an input signal;
6 a determination unit which detects, as a
7 detection interval, an interval in which the amplitude
8 value exceeds a threshold, on the basis of a preset
9 threshold and the amplitude value of the input signal;
10 a peak detector which detects, in the
11 detection interval, peak time when a maximum amplitude
12 value appears and an amplitude value at the peak time as
13 a peak value;
14 a window filter which generates a window
15 function for limiting the amplitude value to a value not
16 more than the threshold by using the peak value output
17 from said peak detector;
18 a delay circuit which delays the input signal
19 such that the peak time output from said peak detector
20 coincides with time when the window function output from
21 said window filter exhibits a minimum value; and
22 a multiplier which multiplies an output signal
23 from said delay circuit by the window function.
2. A circuit according to claim 1, wherein said

2 determination unit comprises
3 an amplitude comparing section which compares
4 the preset threshold with the amplitude value of the
5 input signal, and
6 an interval detecting section which detects an
7 interval in which the amplitude value exceeds the
8 threshold.

3. A circuit according to claim 1, wherein
2 said window filter outputs a window function
3 which exhibits a value of 1 before and after a preset
4 correction interval longer than the detection interval
5 and makes a value at the center of the correction
6 interval proportional to the reciprocal of the peak
7 value, and
8 said delay circuit delays the input signal
9 such that the peak time coincides with the center of the
10 correction interval.

4. A circuit according to claim 3, wherein said
2 window filter outputs a window function exhibiting a
3 value which is 1 until the peak value and becomes not
4 more than a value (threshold/peak value) at the center
5 of the correction interval after the peak time.

5. A circuit according to claim 3, wherein
2 letting threshold/peak value A, $a = (1 - A)/2$,

3 and τ be a value 1/2 a preset correction interval, said
4 window filter outputs a window function $w(t)$ represented
5 by

$$6 \quad w(t) = \begin{cases} 1 - a \left(1 - \cos \left(\frac{\pi t}{\tau} \right) \right) & (0 < t < 2\tau) \\ 1 & (t < 0, 2\tau < t) \end{cases}$$

7 and

8 said delay circuit delays the input signal by
9 the time τ .

6. A circuit according to claim 1, further
2 comprising a threshold input section which inputs a
3 threshold to said determination unit.

7. A CDMA communication apparatus comprising:
2 a plurality of filters which pass
3 predetermined band components containing input signals;
4 a plurality of first frequency converters
5 which convert the signals passing through said filters
6 into signals with different frequencies for the
7 respective channels;
8 a carrier combining unit which combines the
9 output signals from said first frequency converters;
10 an amplitude limiting circuit which limits an
11 amplitude of an output signal from said carrier
12 combining unit;
13 a D/A converter which converts an output

14 signal from said amplitude limiting circuit into an
15 analog signal;
16 a second frequency converter which converts
17 the analog signal into an RF signal; and
18 a transmission power amplifier which amplifies
19 the RF signal to power necessary for transmission.

8. An apparatus according to claim 7, wherein
2 said amplitude limiting circuit comprises
3 an amplitude converter which calculates an
4 amplitude value of an input signal,
5 a determination unit which detects, as a
6 detection interval, an interval in which the amplitude
7 value exceeds a threshold, on the basis of a preset
8 threshold and the amplitude value of the input signal,
9 a peak detector which detects, in the
10 detection interval, peak time when a maximum amplitude
11 value appears and an amplitude value at the peak time as
12 a peak value,
13 a window filter which generates a window
14 function for limiting the amplitude value to a value not
15 more than the threshold by using the peak value output
16 from said peak detector,
17 a delay circuit which delays the input signal
18 such that the peak time output from said peak detector
19 coincides with time when the window function output from
20 said window filter exhibits a minimum value, and

21 a multiplier which multiplies an output signal
22 from said delay circuit by the window function.
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